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PROVISIONAL SPECIFICATION.

Improvements relating to the Warming of Buildings, Steamships or the like for Heating Drying Rooms, Stoves, Ovens, or Supplying Hot Water to Baths, Kitchens or similar Places.

We, **MAURICE PATERSON MCLAHEN**, of 26, Conway Road, Southgate, London, N., and **JOHN ANDREW MACINTYRE**, of 27, Hindes Road, Harrow, Middlesex, Mechanical & Electrical Engineers, do hereby declare the nature of this invention to be as follows:—

- 5 The invention consists of the application to various forms of radiators of appliances or devices whereby it is made possible to employ directly at any radiator heat generated by various fuels all as hereinafter described.
- Generally defined, the invention consists of the application at the place to be heated of heating means in a system out of contact with the atmosphere.
- 10 Where the heating agent is coal, gas, vaporised oil, petrol, alcohol or combustible gas of any kind, derived from oil, coal or furnace waste, *etc.* the gas is to be burned at each radiator or group of radiators the products of combustion being drawn off by means of a fan or pump.
- It is to be burned in a pipe or flue wholly or partially immersed in the fluid
- 15 contained by the radiator. This pipe or flue may be of metallic or non-metallic material. It may be corrugated or arranged with fins, projections or baffles, externally or internally, or charged with surface combustion material as in the Bonecourt boiler.
- The pipes arranged for drawing off the flue gases by creation of a vacuum
- 20 as before described, it is proposed to use for vacuum cleaning, either while the heating system is in full operation, or is not in use. For this purpose tee connections with suitable air-tight caps would be fixed to these pipes at convenient points, to which flexible hose could be attached as required. Dust filters may or may not be used.
- 25 The products of combustion after being drawn away from the radiators may be deflected or drawn through heating pipes and utilised for extra heating surface. By grading the amounts of heating surfaces a group of radiators may be heated from one burner, or the gases may be passed through water heaters still further to lower their temperature.
- 30 In the case of oil or petrol fuels, each radiator may be arranged with an oil reservoir, carburetter or suitable burner, to dispense entirely with gas pipes, the vacuum tubes only being necessary.
- Radiators of the surface combustion or other radiant types by fitting thereon in a gastight manner a quartz front & connecting a vacuum pipe to this
- 35 enclosed space may be operated in a precisely similar manner to those already mentioned & if desirable the gases may be drawn or deflected through a water radiator or heater in the immediate vicinity & water may be used to obtain humidifying vapour.

Radiators fitted with one or more of the above devices may contain any fluid

[Price 6d.]



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either liquid or gas and may either be sealed up or the space in which the fluid is contained may be open to the atmosphere. In the latter case, it is proposed to utilise the evaporation of the heated fluid by means of suitable trays or humidifying devices having graduated openings to the atmosphere to humidify, perfume, or deodorize the air in the room warmed by the radiator. 5

Dated this 9th day of April, 1914.

M. P. McLAREN.
JOHN A. MACINTYRE.

COMPLETE SPECIFICATION.

**Improvements relating to the Warming of Buildings, Steam- 10
ships or the like for Heating Drying Rooms, Stoves, Ovens,
or Supplying Hot Water to Baths, Kitchens or similar
Places.**

We, MAURICE PATERSON McLAREN, of 26, Conway Road, Southgate, London, N., and JOHN ANDREW MACINTYRE, of 27, Hindes Road, Harrow, Middlesex, 15
Electrical & Mechanical Engineers, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The invention relates to the combustion of any solid, liquid, or gaseous fuel in an enclosed chamber out of contact with the atmosphere the air necessary 20
for combustion being drawn into the combustion chamber and the products of combustion being removed by means of a vacuum cleaning system.

We are aware that a heating system has been proposed having an enclosed heater of the Bunsen type combined with mechanical suction and so arranged that practically all the air is drawn into & through the Bunsen mixing tube. 25

When the fuel is required for warming buildings, ships or the like or for heating drying rooms a combustion chamber can be situated within each room or chamber requiring to be warmed or heated. It can be formed within any standard type of water or steam heating radiator, may take the form of an enclosed luminous or non-luminous stove, or it may be formed in a combination 30
of radiator and stove, all as hereinafter described in detail.

When required for warming water or other fluid for domestic or other purposes the fuel may be burned in any closed water heater from which the combustion products are drawn into the vacuum pipes.

When used for cooking food any standard form of cooker may be adapted so 35
that the combustion products can be drawn into the vacuum pipes.

With any form of gas or oil fuel the invention could be applied to any standard water radiator as shown in Figure 1. The gas or oil supply would be controlled by a valve A, and burnt in a protected combustion chamber B and C, the air supply being regulated by a valve or sleeve as in an ordinary Bunsen 40
burner. The gas or oil spray or vapour would mix and be ignited in B and combustion would be completed in, and the products of combustion pass on through, the tube C which is passed right through the radiator. C is connected to a vacuum system by means of the pipe F, E indicating a connecting tee for vacuum cleaning hose. The humidifying pan H is connected with the water 45
in the radiator by means of pipes I₁ and I₂ and the water required may be supplied by hand or connected to the house water service through an automatic ball or other float valve. The humidifying pan may be used to deodorise or may be dispensed with, and the water in the radiator may be sealed up with or without a protective device on the radiator to prevent over pressure. The 50

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pipe C may have a clear bore, be finned, indented, or may be charged with refractory material as in the Bonecourt boiler tube system.

The arrangement to be used with any solid fuel such as coal, coke or anthracite is indicated in Figure 2. The fuel A is burnt in a closed chamber
5 with an airtight feed door C and fitted with mica, glass or quartz radiating front D. The flue gases are drawn through the outlet E, which is connected to a vacuum cleaner system, and may, before passing into this system, be used to warm water in a heater or radiator such as G by passing through the pipe F. B indicates ordinary firebrick lining and the system may be fitted with a
10 humidifying trough I connected to the radiator or heater by tubes H, as described for Figure 1.

A somewhat similar application of the system to that shown in Figure 2 may be used for gas and oil fuel. This is shown in Figure 3. The gas or vapour and air necessary for its combustion are drawn in at J through a porous
15 block of firebrick fitted in an iron frame A and burned on the surface of this block as in the Bonecourt system. The hollow space B at the back of the block forms the mixing chamber for the air and gas, and the pipe E connects the front space C with a vacuum cleaner system. The heat is radiated through the quartz, mica or glass front D, which forms the front cover of the space C.
20 The combustion products may be cooled by passing through a radiator F, which may be connected by means of pipes H with a humidifying trough G, all as shown in Figure 1 and described above. I is an adjustable cover on the humidifying trough by means of which the rate of evaporation may be controlled.

25 The application of the system to drying or baking ovens cooking stoves & such like consists of forming combustion chambers at suitable points in such ovens or stoves and connecting the said combustion chambers to the pipes of a vacuum cleaning system exactly as proposed for radiators already described.

Having now particularly described and ascertained the nature of our invention
30 and in what manner the same is to be performed, we declare that what we claim is:—

(1) The combination of air warming and humidifying, water heating or cooking apparatus with vacuum cleaner systems in that the combustion products from the fuel used for warming are removed from and the air required for the
35 combustion is drawn into enclosed combustion chambers by connecting said chambers to the pipes of the vacuum cleaning systems.

(2) The alterations and additions as described in specification and detailed in drawings to the various standard appliances for air warming, humidifying deodorising, and water heating whereby these appliances may be adapted for
40 use with vacuum cleaning systems.

(3) The application of the luminous type of radiator described in the specification to various culinary operations such as boiling, baking and roasting, the products of combustion being drawn away into a vacuum cleaner system.

Dated the 1st day of April, 1915.

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M. P. McLAREN.
J. MACINTYRE.

[This Drawing is a reproduction of the Original on a reduced scale.]

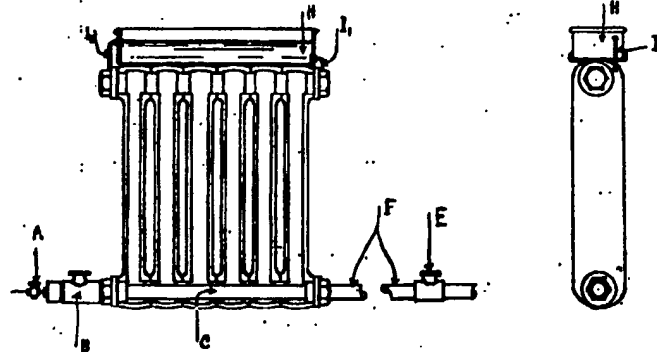


FIGURE 1

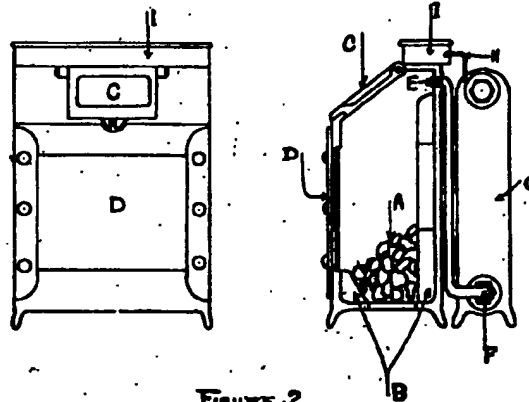


FIGURE 2

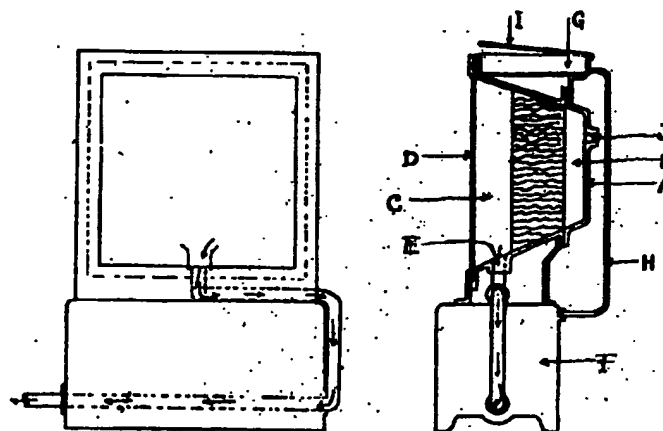


FIG 3

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